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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,804	11/20/2003	Christel-Loic Tisse	S1022.81060US00	9712

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EXAMINER
LIEW, ALEX KOK SOON

ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
09/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
	10/717,804	TISSE ET AL.
Office Action Summary	Examiner	Art Unit	
	Alex Liew	2624	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 July 2007</u>.

2a)☒ This action is **FINAL.** 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 14-20* is/are rejected.

7)☒ Claim(s) *6-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

　　Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____.

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
　　Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
　　Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

The amendment filed on July 7, 2007 is entered and made of record.

Response to Applicant's Arguments

1.   On page 6 of the reply, the applicant describes the current invention as selecting

the first set images, which are not blurry and selecting a 'clearest image' by calculating

a 'second approximate characteristic definition score.' In Choi, Choi calculates the best

focused image, shown in equation 15, using method called frequency selective

weighted median filter (FSWM, in current invention FSWM reads on 'approximate

characteristic definition score'). A focused image is inherently, an image, which has

minimum amount of blurred and also means that it is the sharpest image that can be

obtain. The term 'clearest image' can be interpreted broadly to include, being the

sharpest image or an image with best contrast; in the current case, the examiner will

interpret the 'clearest image' being a sharpest image, which is read by Choi.

2.   On pages 6 to 7 of the reply, the applicant argues that the combination of Zhang,

Choi and Suzaki is improper. Specifically, the applicant pointed out that the examiner

'incorrectly characterized' the second approximate characteristic definition scoring as

being the median Hamming distance calculation. Then, the applicant pointed out Zhang

does not search for the clearest image in the set but rather, the image that best

represent the other images in the set.

The examiner would like to clarify how the combination of Zhang, Choi and Suzaki read

on the current invention.

Zhang discloses a method of selecting an eye image from a set of digital images based

on its definition (see figure 1 element 33, where it selects the best eye images from M −

1 other images), the method comprising:

- computing the focus value F of each of the M images collected (see figure 1,

   element 18);

- selecting a subset of images for which said first score is greater than a

   predetermined threshold (see figure 1, element 18, N images are selected from

   the M number of images collected) and

- for each image in the subset of images, calculating a median of the Hamming

   distance for each of the N images against N − 1 other selected iris images (see

   figure 1, element 20).

In the current invention, the first approximate characteristic definition score is calculated

for pre-focusing function, shown in figure 2, element 4 of the current invention. Zhang

did not use cumulating gradient in a single direction to determine pre-focusing settings.

However, Choi introduces another method to determine the focus settings for an image.

Choi discloses cumulating of the gradient in a single direction and discloses applying

gradient accumulation operation to luminance values of pixels (see equation 15, is the

equation use to accumulate image pixel values in the vertical and horizontal directions).

The examiner only replaced the focus calculating technique in Zhang by the method

taught by Choi to determine the most focused image, which is using frequency selective weighted median. Also there is no-where in claim 1, which claims searching for the clearest image in the set; the claim only has one selecting sub-set of images, but does not claim to have selecting a master image. One skill in the art would include gradient accumulation method to find the best image because to eliminate impulsive noise within the image (see abstract of Choi) to improve image quality for individual identification.

Choi teaches reducing the size of an area window to view the image more in detail, shown in figure 2, area 1. Zhang and Choi do not disclose locating the pupil in the image and placing an examination window centered and around the pupil. Suzaki discloses approximately locating a pupil in the image (see fig 3 – 2) and defining, from the approximate location of the pupil, an examination window centered on the approximate location (see fig 10 – 302). One skill in the art would include placing a window surrounding the eye image because obtain the correct set of iris pixels to properly analyze the features of the iris / eye to reduce errors in individual identification.

DETAILED ACTION

Claim Objections

Claims 6 – 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regards to claim 6, the examiner cannot find applicable prior art, suggestions and / or motivation teaching dividing the image includes dividing the image into blocks which overlap one another, and a pitch in two directions between two overlapping blocks ranges between one tenth and three quarters of the size of the blocks in combination with all the limitations in claims 1 and 5.

With regards to claim 7, the examiner cannot find applicable prior art, suggestions and / or motivation teaching dividing image into blocks in performed on a sub-sampled image of the digital image and a pitch between two neighboring blocks is dependent on the image sub-sampling ratio in combination with all the limitations in claims 1 and 5.

With regards to claim 8, the examiner cannot find applicable prior art, suggestions and / or motivation approximately locating a pupil in the image is applied to a digital image reduced in size with respect to the original image, the digital image represents the original image with two lateral strips of predetermined width removed in combination with all the limitations in claims 1 and 5.

With regards to claim 9, the examiner cannot find suggestions and / or motivation teaching gradient accumulation operation cumulates a quadratic norm of horizontal and vertical gradients of luminance values of image pixels, the pixels selected at least according to a first maximum luminance threshold of other pixels in the *single* direction in combination with all the limitations of claim 1.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1 – 5 and 14 – 20 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Zhang (US pat no 5,978,494) in view of Choi (IEEE pub titled "New

Autofocusing Technique using the Frequency selective weighted Median Filter for

Cameras") and Suzaki (US pat no 6,307,954).

Zhang discloses a method of selecting an eye image from a set of digital images based

on its definition (see figure 1 element 33, where it selects the best eye images from M –

1 other images), the method comprising:

- computing the focus value F of each of the M images collected (see figure 1,

  element 18);

- selecting a subset of images for which said first score is greater than a

  predetermined threshold (see figure 1, element 18, N images are selected from

  the M number of images collected) and

- for each image in the subset of images, calculating a median of the Hamming

  distance for each of the N images against N – 1 other selected iris images (see

  figure 1, element 20).

In the current invention, the first approximate characteristic definition score is calculated

for pre-focusing function, shown in figure 2, element 4 of the current invention. Zhang

did not use cumulating gradient in a single direction to determine pre-focusing settings.

However, Choi introduces another method to determine the focus settings for an image.

Choi discloses cumulating of the gradient in a single direction and discloses applying

gradient accumulation operation to luminance values of pixels (see equation 15, is the

equation use to accumulate image pixel values in the vertical and horizontal directions).

The examiner only replaced the focus calculating technique in Zhang by the method

taught by Choi to determine the most focused image, which is using frequency selective

weighted median. One skill in the art would include gradient accumulation method to

find the best image because to eliminate impulsive noise within the image (see abstract

of Choi) to improve image quality for individual identification.

Choi teaches reducing the size of an area window to view the image more in

detail, shown in figure 2, area 1. Zhang and Choi do not disclose locating the pupil in

the image and placing an examination window centered and around the pupil. Suzaki

discloses approximately locating a pupil in the image (see fig 3 – 2) and defining, from

the approximate location of the pupil, an examination window centered on the

approximate location (see fig 10 – 302). One skill in the art would include placing a

window surrounding the eye image because obtain the correct set of iris pixels to

properly analyze the features of the iris / eye to reduce errors in individual identification.

With regards to claim 2, an extension to the rejection of claim 1, Suzaki discloses the

examination window has an elongated shape (see fig 10 – 302 – the window is

rectangular).

With regards to claims 3 and 4, an extension to the arguments in claim 1, the selection

of the window size must include information necessary to obtain a meaningful

characteristic score, Hamming distance calculation. If the window size is too small or

too large, the calculated definition score will not be accurate.

With regards to claim 5, an extension of the rejection of claim 1, Suzaki discloses

method of approximately locating a pupil in the image includes dividing the image into

blocks of identical size, the size is chosen according to an expected approximate size of

the pupil to be located (see fig 4a – the eye image is divided into equally sized blocks),

calculating for each block the average luminance (see col. 5 lines 46 – 49 – the mean

density for each block is calculated for the image shown in fig 4a and the resulting

image shown in fig 4b) and searching for a block having the smallest luminance, an

approximate position of the pupil in the image corresponding to a position of the block

having the smallest luminance (see col. 6 lines 34 – 54 – $S(X,Y)$ at the smallest position

will result in the largest value of $P(X,Y)$, where the darkest area of the image occurs).

With regards to claim 14, Zhang discloses a method of claim 1, wherein the second

score assigned to each image is used to select the clearest image from said set (see fig

1 – 33 – the image with the smallest median Hamming distance is the best image the
eye).

With regards to claims 15 and 17, see the rationale and rejection for claim 1.

With regards to claim 16, see the rationale and rejection for claim 2.

With regards to claims 18 and 19, see the rationale and rejection for claim 5. In addition,
the size of each block in Suzaki, shown in figure 4b, is about the size of the pupil.

With regards to claim 20, an extension to arguments of claim 1, Suzaki discloses
dividing the image into sections includes dividing the image into overlapping sections
(see fig 13C – each of the specular reflection spots are enclosed by a rectangular shape
window and they are overlapped wit each other).

Conclusion

This action is made final. Applicant is reminded of the extension of time policy as set
forth in 37 CFR 1.136(a).

A shorten statutory period for reply to this final action is set to expire three
months from the mailing date of this action. In the event a first reply is filed within two
months of the mailing date of this final action and the advisory action is not mailed until
after the end of the three-month shorten statutory period, then the shorten statutory

period will expire on the date the advisory action is mailed, and any extension fee

pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory

action. In no event, however will the statutory period for reply expire later than six

months from the mailing date of the final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Alex Liew whose telephone number is (571)272-8623.

The examiner can normally be reached on 9:30AM - 7:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matthew Bella can be reached on (571) 272-7778. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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8/21/07
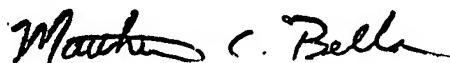
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